

CLAIMS

1. A semiconductor package obtained by collectively fabricating a plurality of semiconductor packages on a wafer in a batch process and dicing the  
5 resulting wafer product into discrete semiconductor packages, wherein

said semiconductor package is a stacked body formed by bonding two or more semiconductor devices through an insulating layer;

10 each of said semiconductor devices comprises a substrate and a device pattern formed on a surface thereof; and

a device pattern surface of a lower semiconductor device faces a non-device pattern surface  
15 of a semiconductor device stacked on said lower semiconductor device.

2. A semiconductor package as defined in claim 1, wherein said semiconductor device positioned as the lowermost layer further comprises a heat radiation layer,  
20 formed of a material having a high heat transfer rate, on the non-device pattern surface thereof.

3. A semiconductor package as defined in claim 2, wherein said heat radiation layer is one deposited on the non-device pattern surface of a wafer as the lowermost  
25 layer, before said semiconductor packages are diced.

4. A semiconductor package as defined in claim 2 or 3, wherein said heat radiation layer is one formed by a thin film formation technology.

5. A semiconductor package as defined in claim 2 or 3, wherein said heat radiation layer is made of  
30 copper, aluminum or an alloy.

6. A semiconductor package as defined in claim 2 or 3, wherein said heat radiation layer also acts as a support.

35 7. A semiconductor package as defined in claim 1 or 2, wherein said insulating layer comprises a polyimide resin or an epoxy resin.

8. A semiconductor package as defined in claim 1 or 2, wherein said semiconductor device positioned as the uppermost layer further comprises a resin sealing layer on the device pattern surface thereof, and said resin  
5 sealing layer is one formed on the device pattern surface of the wafer as the uppermost layer, before said semiconductor package is diced.

9. A semiconductor package as defined in claim 1 or 2, wherein the device patterns of said semiconductor  
10 devices stacked are electrically connected to one another through a re-wiring layer and a substrate through-electrode that are simultaneously formed in one semiconductor device.

10. A semiconductor package as defined in claim 9,  
15 wherein each of said re-wiring layer and said substrate through-electrode is formed of copper or its alloy.

11. A method of producing a semiconductor package comprising a stacked body of two or more semiconductor devices each having a substrate and a device pattern  
20 formed on a surface thereof, comprising the steps of:  
processing a wafer comprising a semiconductor material to collectively fabricate a plurality of semiconductor devices having a predetermined device pattern on a surface thereof in a batch process to  
25 thereby produce a semiconductor device-packaged wafer and repeating the production of the semiconductor device-packaged wafer;

bonding another semiconductor device-packaged wafer onto a lower semiconductor device-packaged  
30 wafer through an insulating layer with a non-device pattern surface of said another semiconductor device-packaged wafer facing downward, wherein in a step of producing said another semiconductor device-packaged wafer, a wafer comprising the semiconductor material is  
35 bonded onto the device pattern surface of said lower semiconductor device-packaged wafer, and said bonded wafer is fabricated to collectively fabricate a plurality

of semiconductor devices having a predetermined device pattern on a surface thereof; and

after bonding of a required number of said semiconductor device-packaged wafers necessary for completing said semiconductor package is completed, dicing the resulting wafer stacked body along a predetermined dicing line to obtain discrete semiconductor packages from said wafer stacked body.

12. A production method of a semiconductor package as defined in claim 11, wherein a heat radiation layer is formed from a material having a high heat transfer rate on the non-device pattern surface of said semiconductor device-packaged wafer as the lowermost layer in said wafer stacked body.

13. A production method of a semiconductor package as defined in claim 12, wherein said heat radiation layer is formed by a thin film formation technology.

14. A production method of a semiconductor package as defined in claim 12 or 13, wherein said heat radiation layer is formed of copper, aluminum or an alloy thereof.

15. A production method of a semiconductor package as defined in claim 11 or 12, wherein said insulating layer is formed of a polyimide resin or an epoxy resin.

16. A production method of a semiconductor package as defined in claim 11 or 12, wherein a resin sealing layer is further formed on the device pattern surface of said semiconductor device-packaged wafer as the uppermost layer in said wafer stacked body.

17. A production method of a semiconductor package as defined in claim 11 or 12, wherein a re-wiring layer and a substrate through-electrode are simultaneously formed in the step of producing said another semiconductor device-packaged wafer.

18. A production method of a semiconductor package as defined in claim 17, wherein said re-wiring layer and said substrate through-electrode are formed of copper or an alloy thereof.